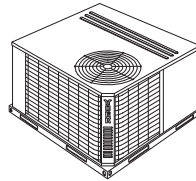


# INSTALLATION MANUAL

## R-410A AFFINITY SERIES

DEZ024-060

2-5 Ton



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## General

YORK® Affinity Model DEZ units are factory assembled cooling units designed for outdoor installation on a roof top or a slab. Field-installed electric heater accessories are available to provide supplemental electric heat combined with electric cooling.

The units are completely assembled on rigid, removable base rails. All piping, refrigerant charge, and electrical wiring is factory installed and tested. The units require only electric power and duct connections at the point of installation.

The electric heaters have nickel-chrome resistance wire elements and utilize single point power connection.

### Safety Considerations

This is a safety alert symbol ▲. When you see this symbol on labels or in manuals, be alert to the potential for personal injury.

Understand and pay particular attention the signal words **DANGER**, **WARNING** or **CAUTION**.

**DANGER** indicates an **imminently** hazardous situation, which, if not avoided, **will result in death or serious injury**.

**WARNING** indicates a **potentially** hazardous situation, which, if not avoided, **could result in death or serious injury**.

**CAUTION** indicates a potentially hazardous situation, which, if not avoided **may result in minor or moderate injury**. It is also used to alert against unsafe practices and hazards involving only property damage.

### ▲ WARNING

Improper installation may create a condition where the operation of the product could cause personal injury or property damage. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or for additional information, consult a qualified contractor, installer or service agency.

**⚠ CAUTION**

This product must be installed in strict compliance with the installation instructions and any applicable local, state and national codes including, but not limited to building, electrical, and mechanical codes.

**⚠ WARNING**

Before performing service or maintenance operations on unit, turn off main power switch to unit. Electrical shock could cause personal injury. Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual. For assistance or additional information consult a qualified installer or service agency.

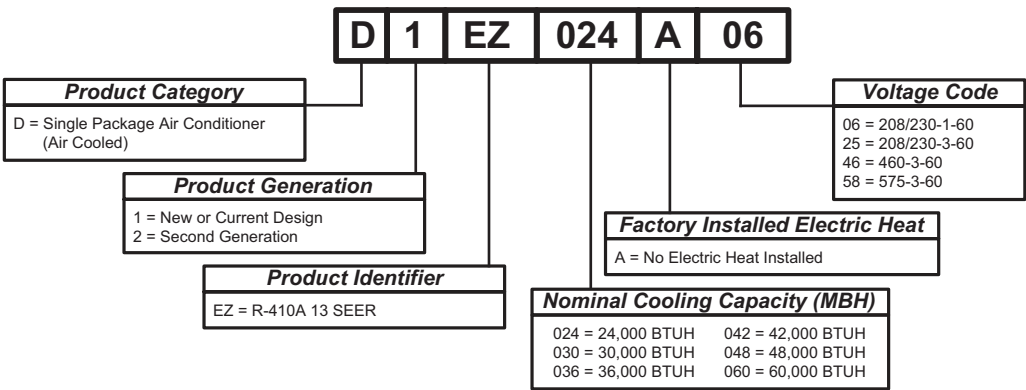
**⚠ CAUTION**

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gage sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

Due to system pressure, moving parts, and electrical components, installation and servicing of air conditioning equipment can be hazardous. Only qualified, trained service personnel should install, repair, or service this equipment. Untrained personnel can perform basic maintenance functions of cleaning coils and filters and replacing filters.

Observe all precautions in the literature, labels, and tags accompanying the equipment whenever working on air conditioning equipment. Be sure to follow all other applicable safety precautions and codes including.

**Nomenclature**



Wear safety glasses and work gloves. Use quenching cloth and have a fire extinguisher available during brazing operations.

**Inspection**

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing.

**Reference**

Additional information is available in the following reference forms:

- Technical Guide - DEZ024-060, 294604
- General Installation - DEZ024-060, 547388
- Electric Heat Accessory - 035-16605-003-E-0705

**Renewal Parts**

Contact your local York® parts distribution center for authorized replacement parts.

**⚠ CAUTION**

This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including, but not limited to, building, electrical, and mechanical codes.

**⚠ WARNING**

Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

**⚠ CAUTION**

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

## Installation

### Limitations

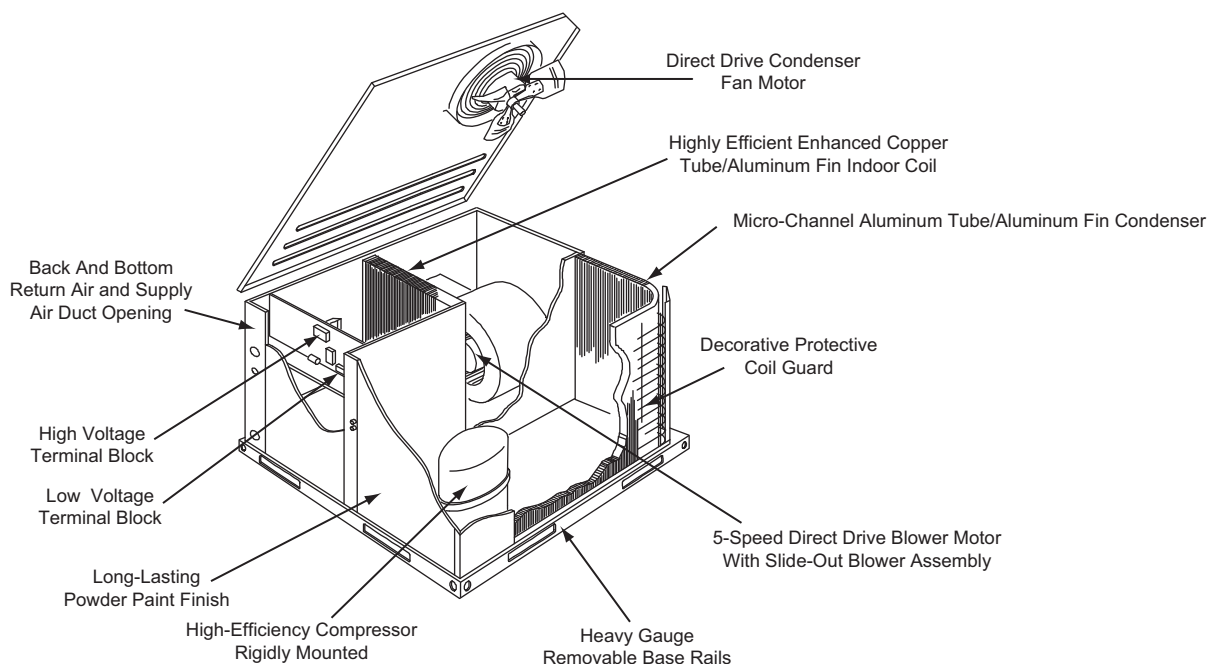
These units must be installed in accordance with the following national and local safety codes.

1. National Electrical Code ANSI/NFPA No. 70 or Canadian Electrical Code Part 1, C22.1 (latest editions).
2. Local plumbing and waste water codes and other applicable local codes.

Refer to Table 6 for unit physical data and to Table 5 for electrical data.

If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense.

Size of unit for proposed installation should be based on heat loss/heat gain calculations made in accordance with industry recognized procedures identified by the Air Conditioning Contractors of America.



**Figure 1: Component Location**

**Table 1: Unit Limitations**

| Size<br>(Tons) | Unit Voltage | Unit Limitations |     |                             |
|----------------|--------------|------------------|-----|-----------------------------|
|                |              | Applied Voltage  |     | Outdoor DB Temp<br>Max (°F) |
|                |              | Min              | Max |                             |
| 024<br>(2.0)   | 208/230-1-60 | 187              | 252 | 125                         |
| 030<br>(2.5)   | 208/230-1-60 | 187              | 252 | 125                         |
| 036<br>(3.0)   | 208/230-1-60 | 187              | 252 | 125                         |
|                | 208/230-3-60 | 187              | 252 | 125                         |
|                | 460-3-60     | 432              | 504 | 125                         |
|                | 575-3-60     | 540              | 630 | 125                         |
| 042<br>(3.5)   | 208/230-1-60 | 187              | 252 | 125                         |
|                | 208/230-3-60 | 187              | 252 | 125                         |
|                | 460-3-60     | 432              | 504 | 125                         |
|                | 575-3-60     | 540              | 630 | 125                         |
| 048<br>(4.0)   | 208/230-1-60 | 187              | 252 | 115                         |
|                | 208/230-3-60 | 187              | 252 | 115                         |
|                | 460-3-60     | 432              | 504 | 115                         |
|                | 575-3-60     | 540              | 630 | 115                         |
| 060<br>(5.0)   | 208/230-1-60 | 187              | 252 | 115                         |
|                | 208/230-3-60 | 187              | 252 | 115                         |
|                | 460-3-60     | 432              | 504 | 115                         |
|                | 575-3-60     | 540              | 630 | 115                         |

## Location

Use the following guidelines to select a suitable location for these units.

1. Unit is designed for outdoor installation only.
2. Condenser must have an unlimited supply of air. Where a choice of location is possible, position unit on either north or east side of building.
3. For ground level installation, a level pad or slab should be used. The thickness and size of the pad or slab used should meet local codes and unit weight. Do not tie the slab to the building foundation.
4. For roof top installation, be sure the structure can support the weight of the unit plus any field installed components. Unit must be installed on a level roof curb or appropriate angle iron frame providing adequate support under the compressor/condenser section.
5. Maintain level tolerance of unit to 1/8" maximum.

### WARNING

Do not permit overhanging structures or shrubs to obstruct condenser air discharge outlet, combustion air inlet or vent outlets.

## Clearances

All units require certain clearances for proper operation and service. Refer to Table 4 for the clearances required for construction, servicing and proper unit operation.

## Rigging And Handling

Exercise care when moving the unit. Do not remove any packaging until the unit is near the place of installation. Rig the unit by attaching chain or cable slings to the lifting holes provided in the base rails. Spreader bars, whose length exceeds the largest dimension across the unit, **MUST** be used across the top of the unit.

### CAUTION

If a unit is to be installed on a roof curb other than a York® roof curb, gasketing must be applied to all surfaces that come in contact with the unit underside.

### CAUTION

Before lifting, make sure the unit weight is distributed equally on the rigging cables so it will lift evenly.

Units may be moved or lifted with a forklift. Slotted openings in the base rails are provided for this purpose.

### CAUTION

All panels must be secured in place when the unit is lifted.  
The condenser coils should be protected from rigging cable damage with plywood or other suitable material.

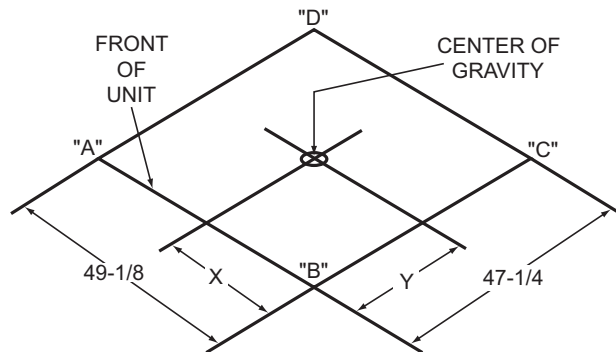


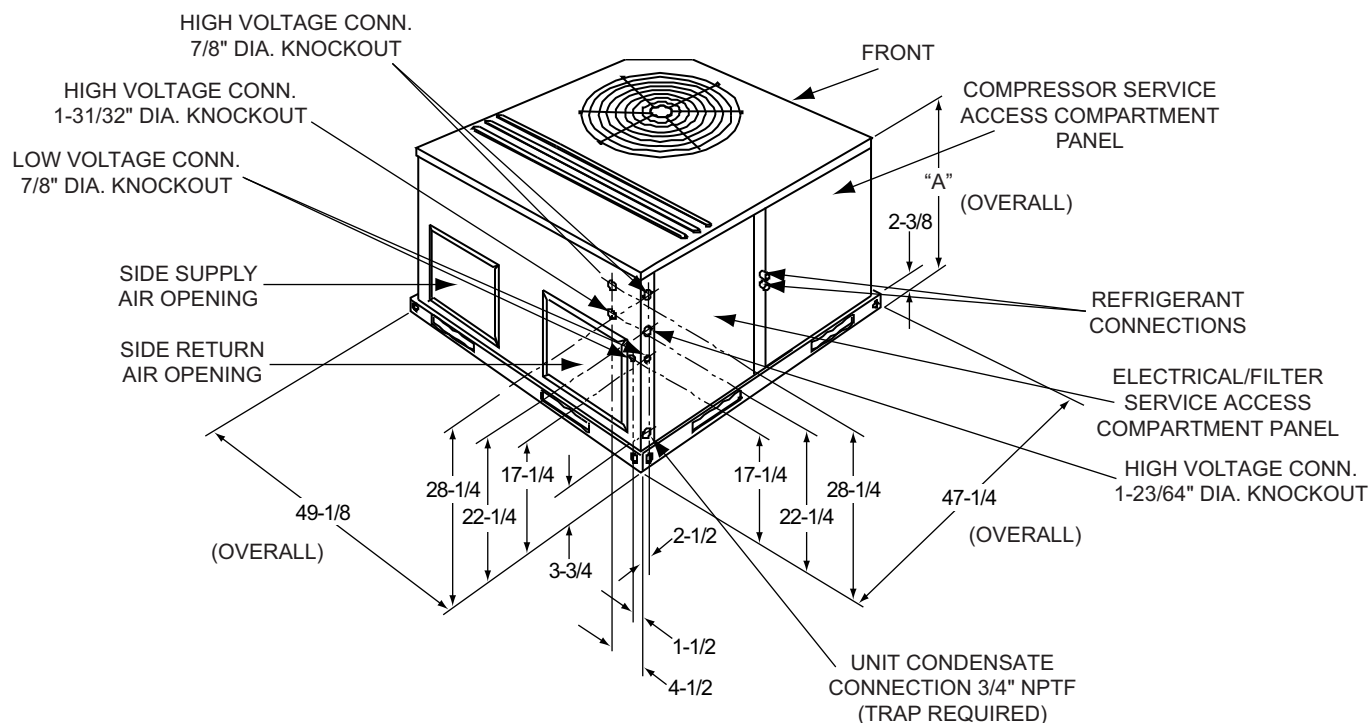
Figure 2: Unit 4 Point Load Weight

| Size<br>(Tons) | Weight (lbs.) |           | Center of Gravity |       | 4 Point Load Location (lbs.) |    |     |     |
|----------------|---------------|-----------|-------------------|-------|------------------------------|----|-----|-----|
|                | Shipping      | Operating | X                 | Y     | A                            | B  | C   | D   |
| 024<br>(2.0)   | 379           | 374       | 23                | 23.25 | 92                           | 85 | 95  | 102 |
| 030<br>(2.5)   | 380           | 375       | 23                | 22.25 | 88                           | 82 | 99  | 106 |
| 036<br>(3.0)   | 384           | 379       | 23                | 22.25 | 89                           | 83 | 100 | 107 |
| 042<br>(3.5)   | 405           | 400       | 23                | 21.25 | 90                           | 83 | 109 | 118 |
| 048<br>(4.0)   | 406           | 401       | 21.5              | 21.75 | 98                           | 80 | 101 | 123 |
| 060<br>(5.0)   | 410           | 405       | 23.5              | 22.75 | 95                           | 92 | 107 | 110 |

**Table 2: Unit Accessory Weights**

| Unit Accessory                 | Model | Weight (lbs.) |           |
|--------------------------------|-------|---------------|-----------|
|                                |       | Shipping      | Operating |
| Add Economizer                 | All   | 45            | 40        |
| Add Electric Heat <sup>1</sup> | All   | 13            | 12        |

1. Weight given is for the maximum heater size available (25 kW).

**Figure 3: Unit Dimensions****Table 3: Unit Dimensions Front**

| Unit Size          | Dimensions |
|--------------------|------------|
|                    | "A"        |
| 024, 030, 036, 042 | 33-1/2     |
| 048, 060           | 41-1/2     |

**Table 4: Unit Clearances**

| Direction        | Distance (in.) | Direction             | Distance (in.) |
|------------------|----------------|-----------------------|----------------|
| Top <sup>1</sup> | 36             | Right                 | 24             |
| Front            | 12             | Left                  | 24             |
| Rear             | 0              | Bottom <sup>2 3</sup> | 0              |

- Units must be installed outdoors. Over hanging structure or shrubs should not obscure condenser air discharge outlet.
- Units may be installed on combustible floors made from wood or class A, B or C roof covering materials.
- Minimum Clearance of 1 inch all sides of supply air duct for the first 3 foot of duct for 20 & 25 kW., zero inches there after. For all other heaters, zero inch clearance all sides for entire length of duct.

**Note:** For units applied with a roof curb, the minimum clearance may be reduced from 1 inch to 1/2 inch between combustible roof curb material and this supply air duct.

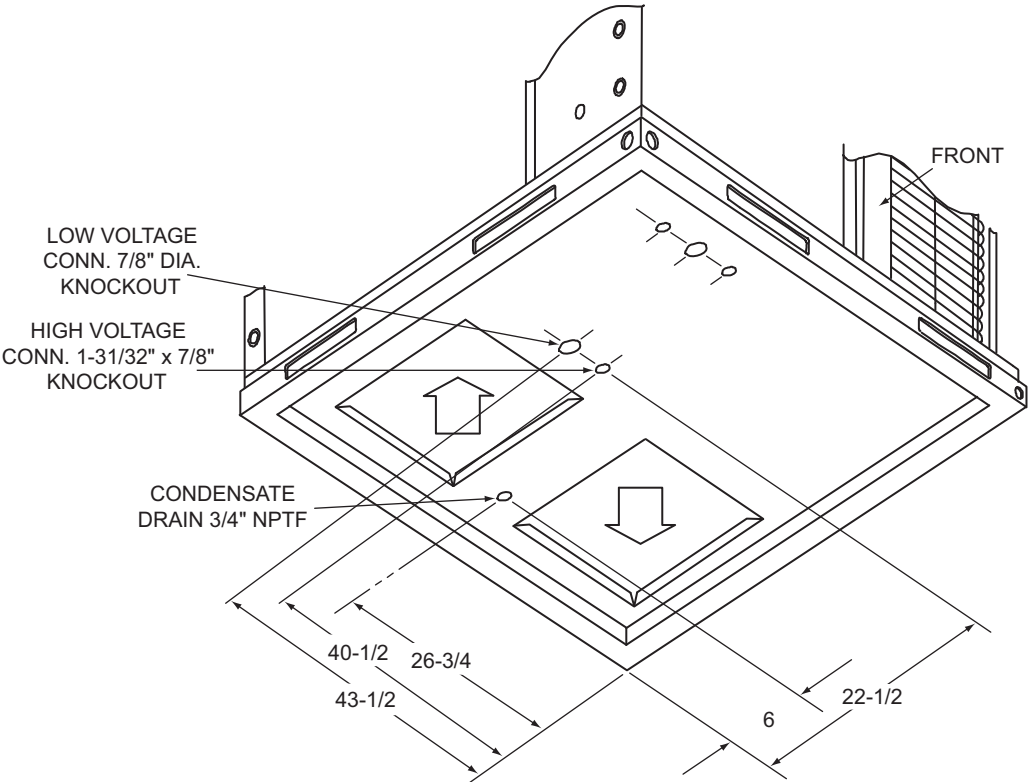


Figure 4: Dimensions Front and Bottom

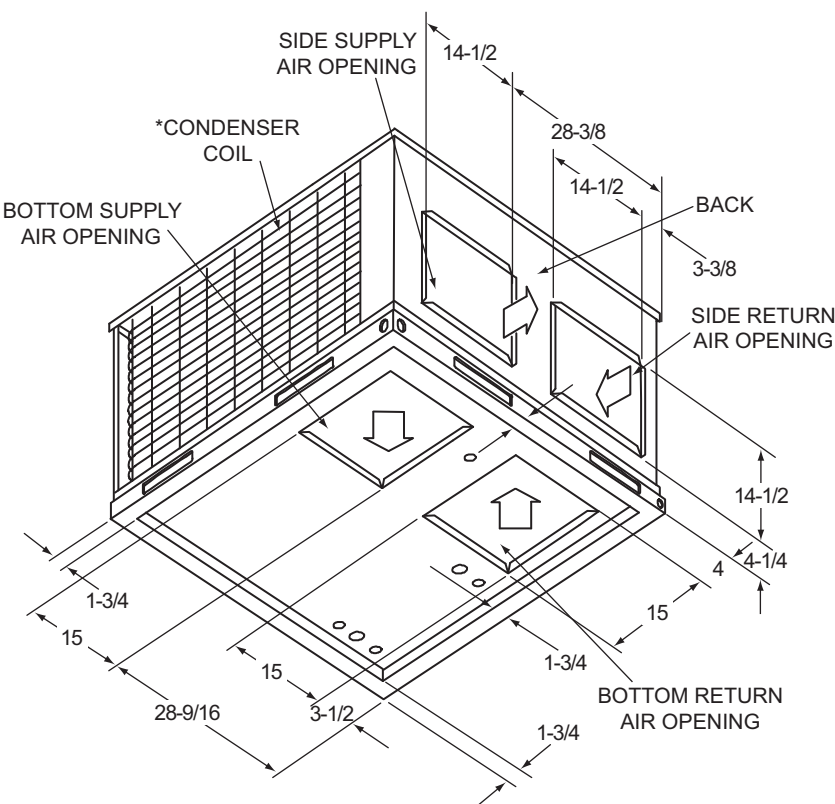
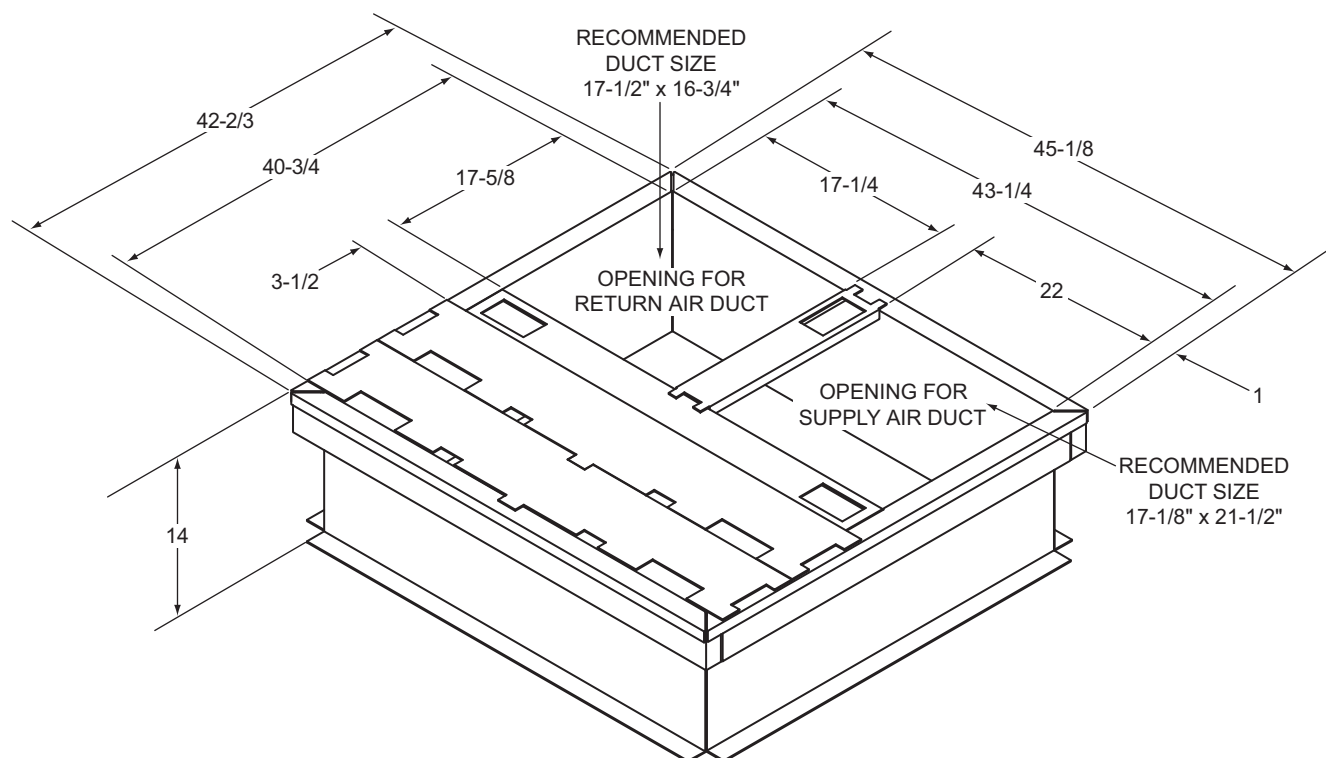


Figure 5: Dimensions Back and Bottom



**Figure 6: Roof Curb<sup>1</sup>**

### Ductwork

These units are adaptable to downflow use as well as rear supply and return air duct openings. To convert to downflow, use the following steps:

1. Remove the duct covers found in the bottom return and supply air duct openings. There are four (4) screws securing each duct cover (save these screws to use in Step 2).
2. Install the duct covers (removed in step one) to the rear supply and return air duct openings. Secure with the four (4) screws used in step one.
3. Seal duct covers with silicone caulk.

Duct work should be designed and sized according to the methods of the Air Conditioning Contractors of America (ACCA), as set forth in their Manual D.

A closed return duct system shall be used. This shall not preclude use of economizers or ventilation air intake. Flexible joints may be used in the supply and return duct work to minimize the transmission of noise.

### CAUTION

When fastening duct work to the side duct flanges on the unit, insert the screws through the duct flanges only. DO NOT insert the screws through the casing. Outdoor duct work must be insulated and waterproofed.

<sup>1</sup>. 8" Roof Curb also available.

**NOTE:** Be sure to note supply and return openings.

Refer to Figures 4 and 5 for information concerning rear and bottom supply and return air duct openings.

### Roof Curb

On applications when a roof curb is used, the unit must be positioned on the curb so the front of the unit is tight against the curb.

### Filters

Single phase units are shipped without a filter or filter racks. It is the responsibility of the installer to secure a filter in the return air ductwork or install a Filter/Frame Kit (1FF0114).

A filter rack and high velocity filters are standard on three phase units.

Filters must always be used and must be kept clean. When filters become dirt laden, insufficient air will be delivered by the blower, decreasing your units efficiency and increasing operating costs and wear-and-tear on the unit and controls.

Filters should be checked monthly; this is especially important since this unit is used for both heating and cooling.

### Condensate Drain

A condensate trap is recommended to be installed in the condensate drain. The plumbing must conform to local codes.

Use a sealing compound on male pipe threads. Install the condensate drain line (3/4" NPTF) to spill into an open drain.



## Service Access

Access to all serviceable components is provided at the following locations:

- Blower compartment access panel
- Electrical/Filter access panel
- Compressor access panel
- Refrigerant connections

Refer to Figures 1 and 3 for location of these access locations and minimum clearances in Table 4.

### CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system. Gage sets, hoses, refrigerant containers and recovery systems must be designed to handle R-410A. If you are unsure, consult the equipment manufacturer. Failure to use R-410A compatible servicing equipment may result in property damage or injury.

### WARNING

Wear safety glasses and gloves when handling refrigerants. Failure to follow this warning can cause serious personal injury.

Refer to Figure 10 for the R-410A quick reference guide.

## Thermostat

The room thermostat should be located on an inside wall approximately 56" above the floor where it will not be subject to drafts, sun exposure or heat from electrical fixtures or appliances. Follow manufacturer's instructions enclosed with the thermostat for general installation procedure. Four color coded insulated wires (minimum #18 AWG) should be used to connect thermostat to unit. See Figure 7.

## Power And Control Wiring

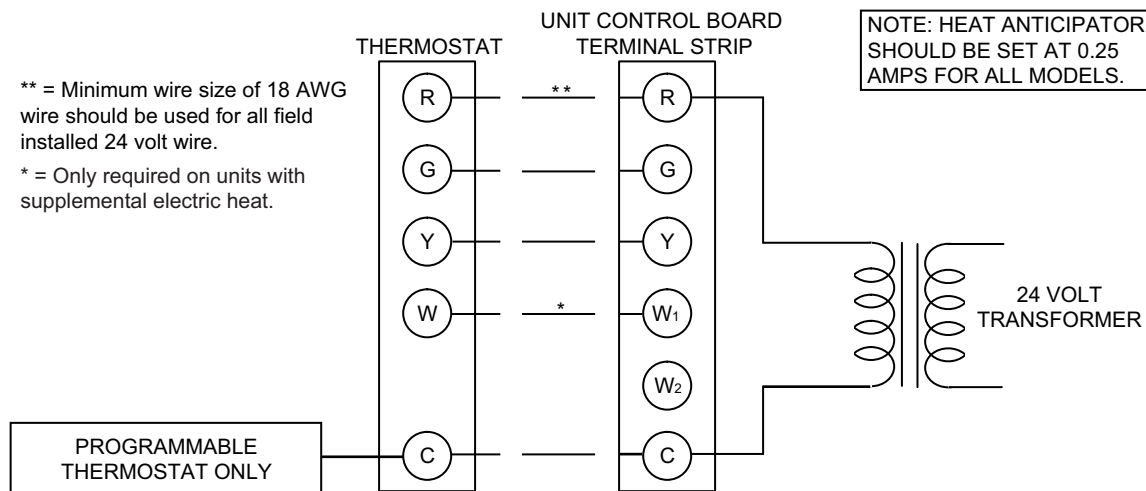
Field wiring to the unit must conform to provisions of the current N.E.C. ANSI/NFPA No. 70 or C.E.C. and/or local ordinances. The unit must be electrically grounded in accordance with local codes or, in their absence, with the N.E.C./C.E.C. Voltage tolerances which must be maintained at the compressor terminals during starting and running conditions are indicated on the unit Rating Plate and Table 5.

The wiring entering the cabinet must be provided with mechanical strain relief.

A fused disconnect switch should be field provided for the unit. If any of the wire supplied with the unit must be replaced, replacement wire must be of the type shown on the wiring diagram.

Electrical line must be sized properly to carry the load. Each unit must be wired with a separate branch circuit fed directly from the meter panel and properly fused.

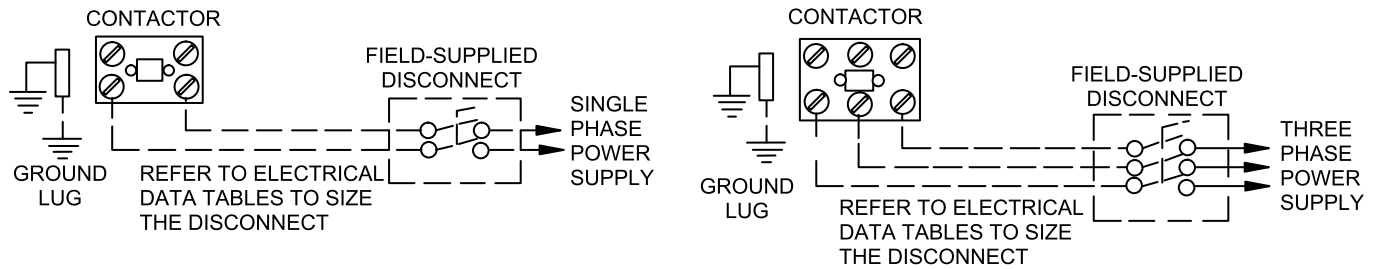
Refer to Figures 7 and 8 for typical field wiring and to the appropriate unit wiring diagram for control circuit and power wiring information.



**CAUTION:** Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

**Figure 7: Typical Field Control Wiring Diagram**





**Figure 8: Typical Field Power Wiring Diagram**

**Table 5: Electrical Data**

| Size<br>(Tons) | Volt         | Compressors<br>(each) |     |     | OD Fan<br>Motors<br>(each) | Supply<br>Blower<br>Motor | Electric Heat Option |           |        |             | MCA <sup>1</sup><br>(Amps) | Max Fuse <sup>2</sup> /<br>Breaker <sup>3</sup> Size<br>(Amps) |
|----------------|--------------|-----------------------|-----|-----|----------------------------|---------------------------|----------------------|-----------|--------|-------------|----------------------------|----------------------------------------------------------------|
|                |              | RLA                   | LRA | MCC |                            |                           | Model                | kW        | Stages | Amps        |                            |                                                                |
| 024<br>(2.0)   | 208/230-1-60 | 8.3                   | 43  | 13  | 1.3                        | 4.1                       | None                 | -         | -      | -           | 15.8                       | 20                                                             |
|                |              |                       |     |     |                            |                           | 2NH04500506          | 3.8 / 5   | 1      | 18.1 / 20.8 | 27.7 / 31.2                | 30 / 35                                                        |
|                |              |                       |     |     |                            |                           | 2NH04500706          | 5.6 / 7.5 | 2      | 27.1 / 31.3 | 39 / 44.2                  | 40 / 45                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7 | 50.3 / 57.2                | 60 / 60                                                        |
| 030<br>(2.5)   | 208/230-1-60 | 13.1                  | 74  | 21  | 1.3                        | 4.1                       | None                 | -         | -      | -           | 21.8                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04500506          | 3.8 / 5   | 1      | 18.1 / 20.8 | 27.7 / 31.2                | 30 / 35                                                        |
|                |              |                       |     |     |                            |                           | 2NH04500706          | 5.6 / 7.5 | 2      | 27.1 / 31.3 | 39 / 44.2                  | 40 / 45                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7 | 50.3 / 57.2                | 60 / 60                                                        |
| 036<br>(3.0)   | 208/230-1-60 | 14.7                  | 74  | 23  | 1.3                        | 4.1                       | 2NH04501506          | 11.3 / 15 | 2      | 54.2 / 62.5 | 72.8 / 83.3                | 80 / 90                                                        |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 23.8                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04500506          | 3.8 / 5   | 1      | 18.1 / 20.8 | 27.7 / 31.2                | 35 / 35                                                        |
|                |              |                       |     |     |                            |                           | 2NH04500706          | 5.6 / 7.5 | 2      | 27.1 / 31.3 | 39 / 44.2                  | 40 / 45                                                        |
|                | 208/230-3-60 | 9.1                   | 68  | 14  | 1.3                        | 4.1                       | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7 | 50.3 / 57.2                | 60 / 60                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501525          | 11.3 / 15 | 1      | 31.3 / 36.1 | 44.2 / 50.2                | 45 / 60                                                        |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 16.8                       | 25                                                             |
|                | 460-3-60     | 4.5                   | 34  | 7   | 0.8                        | 4.1                       | 2NH04501025          | 7.5 / 10  | 1      | 20.8 / 24.1 | 31.2 / 35.2                | 35 / 40                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501546          | 15        | 1      | 18          | 27.7                       | 30                                                             |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 10.5                       | 15                                                             |
|                | 575-3-60     | 3.8                   | 28  | 6   | 0.6                        | 6.0                       | 2NH04501046          | 10        | 1      | 12          | 20.2                       | 25                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501558          | 15        | 1      | 14.4        | 25.5                       | 30                                                             |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 11.9                       | 15                                                             |
| 042<br>(3.5)   | 208/230-1-60 | 15.7                  | 88  | 25  | 1.7                        | 6.0                       | 2NH04501058          | 10        | 1      | 9.6         | 19.5                       | 20                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501558          | 15        | 1      | 14.4        | 25.5                       | 30                                                             |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 27.3                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04500506          | 3.8 / 5   | 1      | 18.1 / 20.8 | 30.1 / 33.5                | 40 / 40                                                        |
|                | 208/230-3-60 | 9.3                   | 68  | 15  | 1.7                        | 6.0                       | 2NH04500706          | 5.6 / 7.5 | 2      | 27.1 / 31.3 | 41.4 / 46.6                | 45 / 50                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7 | 52.6 / 59.6                | 60 / 60                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501506          | 11.3 / 15 | 2      | 54.2 / 62.5 | 75.2 / 85.6                | 80 / 90                                                        |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 19.3                       | 25                                                             |
|                | 460-3-60     | 5.1                   | 34  | 8   | 1.0                        | 6.0                       | 2NH04501025          | 7.5 / 10  | 1      | 20.8 / 24.1 | 33.6 / 37.6                | 35 / 40                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501525          | 11.3 / 15 | 1      | 31.3 / 36.1 | 46.6 / 52.6                | 50 / 60                                                        |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 13.6                       | 15                                                             |
|                | 575-3-60     | 3.8                   | 28  | 6   | 0.8                        | 6.0                       | 2NH04501046          | 10        | 1      | 12          | 22.5                       | 25                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501546          | 15        | 1      | 18          | 30.1                       | 35                                                             |
|                |              |                       |     |     |                            |                           | None                 | -         | -      | -           | 12.1                       | 15                                                             |
|                | 575-3-60     | 3.8                   | 28  | 6   | 0.8                        | 6.0                       | 2NH04501058          | 10        | 1      | 9.6         | 19.5                       | 20                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501558          | 15        | 1      | 14.4        | 25.5                       | 30                                                             |

Table 5: Electrical Data (Continued)

| Size<br>(Tons) | Volt         | Compressors<br>(each) |     |     | OD Fan<br>Motors<br>(each) | Supply<br>Blower<br>Motor | Electric Heat Option |           |        |              | MCA <sup>1</sup><br>(Amps) | Max Fuse <sup>2</sup> /<br>Breaker <sup>3</sup> Size<br>(Amps) |
|----------------|--------------|-----------------------|-----|-----|----------------------------|---------------------------|----------------------|-----------|--------|--------------|----------------------------|----------------------------------------------------------------|
|                |              | RLA                   | LRA | MCC |                            |                           | Model                | kW        | Stages | Amps         |                            |                                                                |
| 048<br>(4.0)   | 208/230-1-60 | 16.8                  | 115 | 25  | 1.7                        | 6.0                       | None                 | -         | -      | -            | 28.7                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7  | 52.6 / 59.6                | 60 / 60                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501506          | 11.3 / 15 | 2      | 54.2 / 62.5  | 75.2 / 85.6                | 80 / 90                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502006          | 15 / 20   | 2      | 72.2 / 83.3  | 97.8 / 111.7               | 100 / 125                                                      |
|                |              |                       |     |     |                            |                           | 2NH04502506          | 18.8 / 25 | 2      | 90.3 / 104.2 | 120.3 / 137.7              | 125 / 150                                                      |
|                | 208/230-3-60 | 11.2                  | 120 | 18  | 1.7                        | 6.0                       | None                 | -         | -      | -            | 21.7                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501025          | 7.5 / 10  | 1      | 20.8 / 24.1  | 33.6 / 37.6                | 35 / 40                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501525          | 11.3 / 15 | 1      | 31.3 / 36.1  | 46.6 / 52.6                | 50 / 60                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502025          | 15 / 20   | 2      | 41.7 / 48.1  | 59.6 / 67.6                | 60 / 70                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502525          | 18.8 / 25 | 2      | 52.1 / 60.1  | 72.7 / 82.7                | 80 / 90                                                        |
|                | 460-3-60     | 5.1                   | 50  | 8   | 1.0                        | 6.0                       | None                 | -         | -      | -            | 13.6                       | 15                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501046          | 10        | 1      | 12           | 22.5                       | 25                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501546          | 15        | 1      | 18           | 30.1                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502046          | 20        | 2      | 24.1         | 37.6                       | 40                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502546          | 25        | 2      | 30.1         | 45.1                       | 50                                                             |
|                | 575-3-60     | 4.5                   | 40  | 7   | 0.8                        | 6.0                       | None                 | -         | -      | -            | 12.8                       | 15                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501058          | 10        | 1      | 9.6          | 19.5                       | 20                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501558          | 15        | 1      | 14.4         | 25.5                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502058          | 20        | 2      | 19.2         | 31.6                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502558          | 25        | 2      | 24.1         | 37.6                       | 40                                                             |
| 060<br>(5.0)   | 208/230-1-60 | 26.2                  | 150 | 41  | 2.2                        | 7.6                       | None                 | -         | -      | -            | 42.6                       | 60                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501006          | 7.5 / 10  | 2      | 36.1 / 41.7  | 54.6 / 61.6                | 60 / 70                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501506          | 11.3 / 15 | 2      | 54.2 / 62.5  | 77.2 / 87.6                | 80 / 90                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502006          | 15 / 20   | 2      | 72.2 / 83.3  | 99.8 / 113.7               | 100 / 125                                                      |
|                |              |                       |     |     |                            |                           | 2NH04502506          | 18.8 / 25 | 2      | 90.3 / 104.2 | 122.3 / 139.7              | 125 / 150                                                      |
|                | 208/230-3-60 | 17.9                  | 120 | 28  | 2.2                        | 7.6                       | None                 | -         | -      | -            | 32.2                       | 40                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501025          | 7.5 / 10  | 1      | 20.8 / 24.1  | 35.6 / 39.6                | 45 / 50                                                        |
|                |              |                       |     |     |                            |                           | 2NH04501525          | 11.3 / 15 | 1      | 31.3 / 36.1  | 48.6 / 54.6                | 50 / 60                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502025          | 15 / 20   | 2      | 41.7 / 48.1  | 61.6 / 69.6                | 70 / 70                                                        |
|                |              |                       |     |     |                            |                           | 2NH04502525          | 18.8 / 25 | 2      | 52.1 / 60.1  | 74.7 / 84.7                | 80 / 90                                                        |
|                | 460-3-60     | 9.6                   | 70  | 15  | 1.1                        | 7.6                       | None                 | -         | -      | -            | 20.7                       | 25                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501046          | 10        | 1      | 12           | 24.5                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501546          | 15        | 1      | 18           | 32.1                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502046          | 20        | 2      | 24.1         | 39.6                       | 40                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502546          | 25        | 2      | 30.1         | 47.1                       | 50                                                             |
|                | 575-3-60     | 7.4                   | 53  | 12  | 0.8                        | 7.6                       | None                 | -         | -      | -            | 16.9                       | 20                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501058          | 10        | 1      | 9.6          | 21.5                       | 25                                                             |
|                |              |                       |     |     |                            |                           | 2NH04501558          | 15        | 1      | 14.4         | 27.5                       | 30                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502058          | 20        | 2      | 19.2         | 33.6                       | 35                                                             |
|                |              |                       |     |     |                            |                           | 2NH04502558          | 25        | 2      | 24.1         | 39.6                       | 40                                                             |

1. Minimum Circuit Ampacity.

2. Maximum Over Current Protection per standard UL 1995.

3. Fuse or HACR circuit breaker size installed at factory or field installed.

Table 6: Physical Data

| Component                          | Models              |                     |                     |                     |                     |                     |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
|                                    | DEZ024              | DEZ030              | DEZ036              | DEZ042              | DEZ048              | DEZ060              |
| Nominal Tonnage                    | 2.0                 | 2.5                 | 3.0                 | 3.5                 | 4.0                 | 5.0                 |
| <b>ARI COOLING PERFORMANCE</b>     |                     |                     |                     |                     |                     |                     |
| Gross Capacity @ ARI A point (MBH) | 24.4                | 30.7                | 35.3                | 42.8                | 49.5                | 59.2                |
| ARI net capacity (MBH)             | 24.0                | 30.0                | 34.5                | 41.5                | 48.0                | 57.5                |
| EER                                | 12.62               | 11.55               | 11.36               | 11.78               | 11.92               | 11.03               |
| SEER                               | 13.0                | 13.0                | 13.0                | 13.0                | 13.0                | 13.0                |
| Nominal CFM                        | 780                 | 1050                | 1200                | 1450                | 1500                | 1600                |
| System power (KW)                  | 1.90                | 2.60                | 3.04                | 3.52                | 4.03                | 5.21                |
| Refrigerant type                   | R-410A              | R-410A              | R-410A              | R-410A              | R-410A              | R-410A              |
| Refrigerant charge (lb-oz)         | 3-2                 | 3-7                 | 3-6                 | 4-4                 | 4-0                 | 4-8                 |
| <b>DIMENSIONS (inches)</b>         |                     |                     |                     |                     |                     |                     |
| Length                             | 49 1/8              | 49 1/8              | 49 1/8              | 49 1/8              | 49 1/8              | 49 1/8              |
| Width                              | 47 1/4              | 47 1/4              | 47 1/4              | 47 1/4              | 47 1/4              | 47 1/4              |
| Height                             | 33 1/2              | 33 1/2              | 33 1/2              | 33 1/2              | 41 1/2              | 41 1/2              |
| <b>OPERATING WT. (lbs.)</b>        | 374                 | 375                 | 379                 | 400                 | 401                 | 405                 |
| <b>COMPRESSORS</b>                 |                     |                     |                     |                     |                     |                     |
| Type                               | Recip               | Recip               | Recip               | Recip               | Recip               | Scroll              |
| Quantity                           | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |
| <b>CONDENSER COIL DATA</b>         |                     |                     |                     |                     |                     |                     |
| Face area (Sq. Ft.)                | 11.9                | 11.9                | 11.9                | 11.9                | 15                  | 15                  |
| Rows                               | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |
| Fins per inch                      | 23                  | 23                  | 23                  | 23                  | 23                  | 23                  |
| Tube diameter (in.)                | 0.71/18             | 0.71/18             | 0.71/18             | 0.71/18             | 0.71/18             | 0.71/18             |
| Circuitry Type                     | 2-pass Microchannel | 2-pass Microchannel | 2-pass Microchannel | 2-pass Microchannel | 2-pass Microchannel | 2-pass Microchannel |
| <b>EVAPORATOR COIL DATA</b>        |                     |                     |                     |                     |                     |                     |
| Face area (Sq. Ft.)                | 4.38                | 4.38                | 4.38                | 5.63                | 5.63                | 5.63                |
| Rows                               | 2                   | 2                   | 2                   | 3                   | 2                   | 3                   |
| Fins per inch                      | 15                  | 15                  | 15                  | 15                  | 16                  | 16                  |
| Tube diameter                      | 3/8                 | 3/8                 | 3/8                 | 3/8                 | 3/8                 | 3/8                 |
| Circuitry Type                     | Interlaced          | Interlaced          | Interlaced          | Interlaced          | Interlaced          | Interlaced          |
| Refrigerant control                | Orifice             | Orifice             | Orifice             | Orifice             | Orifice             | Orifice             |
| <b>CONDENSER FAN DATA</b>          |                     |                     |                     |                     |                     |                     |
| Fan diameter (Inch)                | 22                  | 22                  | 22                  | 22                  | 22                  | 22                  |
| Type                               | Prop                | Prop                | Prop                | Prop                | Prop                | Prop                |
| Drive type                         | Direct              | Direct              | Direct              | Direct              | Direct              | Direct              |
| No. speeds                         | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |
| Number of motors                   | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |
| Motor HP each                      | 1/4                 | 1/4                 | 1/4                 | 1/3                 | 1/3                 | 1/3                 |
| RPM                                | 850                 | 850                 | 850                 | 1120                | 1120                | 1100                |
| Nominal total CFM                  | 1800                | 1800                | 2400                | 3000                | 3000                | 3000                |
| <b>DIRECT DRIVE EVAP FAN DATA</b>  |                     |                     |                     |                     |                     |                     |
| Quantity                           | 1                   | 1                   | 1                   | 1                   | 1                   | 1                   |
| Fan Size (Inch)                    | 10 x 8              | 10 x 8              | 11 x 10             | 11 x 10             | 11 x 10             | 11 x 10             |
| Type                               | Centrifugal         | Centrifugal         | Centrifugal         | Centrifugal         | Centrifugal         | Centrifugal         |
| No. speeds                         | 5                   | 5                   | 5                   | 5                   | 5                   | 5                   |
| Motor HP each                      | 1/2                 | 1/2                 | 1/2                 | 3/4                 | 3/4                 | 1                   |
| RPM                                | Variable            | Variable            | Variable            | Variable            | Variable            | Variable            |
| Frame size                         | 48                  | 48                  | 48                  | 48                  | 48                  | 48                  |
| <b>FILTERS</b>                     |                     |                     |                     |                     |                     |                     |
| Quantity - Size                    | 2 - 22 x 14 x 1     | 2 - 22 x 14 x 1     | 2 - 22 x 14 x 1     | 2 - 22 x 14 x 1     | 2 - 22 x 14 x 1     | 2 - 22 x 14 x 1     |

## Compressors

The compressors used in this product are specifically designed to operate with R-410A Refrigerant and cannot be interchanged.

### CAUTION

This system uses R-410A Refrigerant which operates at higher pressures than R-22. No other refrigerant may be used in this system.

The compressors also use a polyolester (POE oil), Mobil 3MA POE. This oil is extremely hygroscopic, meaning it absorbs water readily. POE oil can absorb 15 times as much water as other oils designed for HCFC and CFC refrigerants. Take all necessary precautions to avoid exposure of the oil to the atmosphere.

### CAUTION

Do not leave the system open to the atmosphere. Unit damage could occur due to moisture being absorbed by the **POE oil** in the system. This type of oil is highly susceptible to moisture absorption

POE (polyolester) compressor lubricants are known to cause long term damage to some synthetic roofing materials.

### CAUTION

Exposure, even if immediately cleaned up, may cause embrittlement (leading to cracking) to occur in one year or more. When performing any service that may risk exposure of compressor oil to the roof, take precautions to protect roofing.

Procedures which risk oil leakage include, but are not limited to, compressor replacement, repairing refrigerant leaks, replacing refrigerant components such as filter drier, pressure switch, metering device or coil.

Units are shipped with compressor mountings which are factory-adjusted and ready for operation.

### CAUTION

Do not loosen compressor mounting bolts.

## Phasing

Three-phase, scroll compressors operate in only one direction. If the scroll is drawing low amperage, has similar suction and discharge pressures, or is producing a high noise level, the scroll is misphased. Change the incoming line connection phasing to obtain the proper rotation.

### CAUTION

Scroll compressors require proper rotation to operate properly. Failure to check and correct rotation may result in property damage.

## Airflow Performance

**Table 7: Side Duct Application**

| Model No.<br>DEZ | Blower Speed Setting | External Static Pressure (Inches Water Gauge) |     |      |      |     |      |      |     |      |      |     |      |      |     |      |
|------------------|----------------------|-----------------------------------------------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|
|                  |                      | 0.2                                           |     |      | 0.4  |     |      | 0.6  |     |      | 0.8  |     |      | 1.0  |     |      |
|                  |                      | CFM                                           | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  |
| 024<br>(2.0)     | Low (1)              | 726                                           | 87  | 632  | 629  | 99  | 739  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 768                                           | 97  | 651  | 679  | 110 | 754  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 883                                           | 131 | 704  | 812  | 147 | 797  | 736  | 162 | 889  | 651  | 177 | 979  | -    | -   | -    |
|                  | Medium/High (4)      | 990                                           | 170 | 755  | 934  | 187 | 839  | 868  | 202 | 920  | 791  | 216 | 1000 | 696  | 227 | 1078 |
|                  | High (5)             | -                                             | -   | -    | -    | -   | -    | 985  | 245 | 952  | 913  | 257 | 1022 | 813  | 261 | 1090 |
| 030<br>(2.5)     | Low (1)              | 828                                           | 110 | 673  | 759  | 125 | 771  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 953                                           | 153 | 735  | 894  | 172 | 823  | 824  | 189 | 909  | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 1091                                          | 214 | 807  | 1041 | 234 | 883  | 983  | 253 | 958  | 910  | 269 | 1033 | 785  | 273 | 1106 |
|                  | Medium/High (4)      | 1189                                          | 269 | 861  | 1144 | 288 | 927  | 1091 | 305 | 994  | 1027 | 318 | 1061 | 912  | 316 | 1132 |
|                  | High (5)             | -                                             | -   | -    | 1235 | 347 | 970  | 1186 | 360 | 1028 | 1125 | 368 | 1086 | 1007 | 352 | 1147 |
| 036<br>(3.0)     | Low (1)              | 966                                           | 168 | 771  | 890  | 186 | 860  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1148                                          | 215 | 763  | 1062 | 237 | 841  | 975  | 259 | 918  | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 1258                                          | 255 | 766  | 1167 | 278 | 839  | 1075 | 301 | 911  | 980  | 325 | 983  | -    | -   | -    |
|                  | Medium/High (4)      | 1361                                          | 301 | 778  | 1267 | 325 | 845  | 1170 | 349 | 913  | 1070 | 372 | 981  | 964  | 393 | 1048 |
|                  | High (5)             | 1458                                          | 354 | 797  | 1362 | 379 | 859  | 1262 | 402 | 923  | 1156 | 423 | 986  | 1040 | 436 | 1048 |
| 042<br>(3.5)     | Low (1)              | 1241                                          | 221 | 702  | 1151 | 245 | 778  | 1058 | 268 | 853  | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1406                                          | 299 | 759  | 1325 | 324 | 826  | 1242 | 349 | 893  | 1158 | 373 | 959  | 1072 | 396 | 1025 |
|                  | Medium (3)           | 1536                                          | 376 | 808  | 1461 | 403 | 869  | 1384 | 427 | 928  | 1305 | 449 | 988  | 1223 | 468 | 1046 |
|                  | Medium/High (4)      | 1656                                          | 466 | 858  | 1584 | 492 | 912  | 1509 | 515 | 966  | 1430 | 533 | 1019 | 1344 | 542 | 1070 |
|                  | High (5)             | -                                             | -   | -    | 1687 | 590 | 955  | 1611 | 610 | 1004 | 1527 | 620 | 1051 | 1428 | 615 | 1097 |
| 048<br>(4.0)     | Low (1)              | 1287                                          | 222 | 695  | -    | -   | -    | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1596                                          | 397 | 817  | 1513 | 422 | 875  | 1432 | 447 | 934  | 1354 | 474 | 995  | 1276 | 501 | 1058 |
|                  | Medium (3)           | 1705                                          | 476 | 858  | 1624 | 501 | 911  | 1545 | 526 | 966  | 1466 | 549 | 1021 | 1386 | 571 | 1077 |
|                  | Medium/High (4)      | 1806                                          | 561 | 895  | 1726 | 587 | 945  | 1646 | 610 | 995  | 1564 | 628 | 1046 | 1476 | 639 | 1096 |
|                  | High (5)             | 1898                                          | 652 | 929  | 1819 | 679 | 977  | 1736 | 698 | 1023 | 1646 | 709 | 1069 | 1547 | 706 | 1112 |
| 060<br>(5.0)     | Low (1)              | 1580                                          | 394 | 859  | 1504 | 420 | 917  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1650                                          | 448 | 888  | 1579 | 476 | 945  | 1499 | 478 | 1003 | 1401 | 494 | 1049 | -    | -   | -    |
|                  | Medium (3)           | 1854                                          | 605 | 972  | 1783 | 629 | 1020 | 1703 | 646 | 1065 | 1605 | 648 | 1104 | 1528 | 659 | 1146 |
|                  | Medium/High (4)      | 2120                                          | 856 | 1073 | 2021 | 840 | 1102 | 1908 | 815 | 1127 | 1769 | 772 | 1148 | 1567 | 685 | 1154 |
|                  | High (5)             | 2214                                          | 968 | 1104 | 2089 | 918 | 1121 | 1949 | 859 | 1136 | 1785 | 787 | 1148 | 1576 | 689 | 1154 |

**Table 8: Bottom Duct Application**

| Model No.<br>DEZ | Blower Speed Setting | External Static Pressure (Inches Water Gauge) |     |      |      |     |      |      |     |      |      |     |      |      |     |      |
|------------------|----------------------|-----------------------------------------------|-----|------|------|-----|------|------|-----|------|------|-----|------|------|-----|------|
|                  |                      | 0.2                                           |     |      | 0.4  |     |      | 0.6  |     |      | 0.8  |     |      | 1.0  |     |      |
|                  |                      | CFM                                           | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  | CFM  | W   | RPM  |
| 024<br>(2.0)     | Low (1)              | 726                                           | 87  | 632  | 629  | 99  | 739  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 768                                           | 97  | 651  | 679  | 110 | 754  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 883                                           | 131 | 704  | 812  | 147 | 797  | 736  | 162 | 889  | 651  | 177 | 979  | -    | -   | -    |
|                  | Medium/High (4)      | 990                                           | 170 | 755  | 934  | 187 | 839  | 868  | 202 | 920  | 791  | 216 | 1000 | 696  | 227 | 1078 |
|                  | High (5)             | -                                             | -   | -    | -    | -   | -    | 985  | 245 | 952  | 913  | 257 | 1022 | 813  | 261 | 1090 |
| 030<br>(2.5)     | Low (1)              | 828                                           | 110 | 673  | 759  | 125 | 771  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 953                                           | 153 | 735  | 894  | 172 | 823  | 824  | 189 | 909  | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 1091                                          | 214 | 807  | 1041 | 234 | 883  | 983  | 253 | 958  | 910  | 269 | 1033 | 785  | 273 | 1106 |
|                  | Medium/High (4)      | 1189                                          | 269 | 861  | 1144 | 288 | 927  | 1091 | 305 | 994  | 1027 | 318 | 1061 | 912  | 316 | 1132 |
|                  | High (5)             | -                                             | -   | -    | 1235 | 347 | 970  | 1186 | 360 | 1028 | 1125 | 368 | 1086 | 1007 | 352 | 1147 |
| 036<br>(3.0)     | Low (1)              | 966                                           | 168 | 771  | 890  | 186 | 860  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1148                                          | 215 | 763  | 1062 | 237 | 841  | 975  | 259 | 918  | -    | -   | -    | -    | -   | -    |
|                  | Medium (3)           | 1258                                          | 255 | 766  | 1167 | 278 | 839  | 1075 | 301 | 911  | 980  | 325 | 983  | -    | -   | -    |
|                  | Medium/High (4)      | 1361                                          | 301 | 778  | 1267 | 325 | 845  | 1170 | 349 | 913  | 1070 | 372 | 981  | 964  | 393 | 1048 |
|                  | High (5)             | 1458                                          | 354 | 797  | 1362 | 379 | 859  | 1262 | 402 | 923  | 1156 | 423 | 986  | 1040 | 436 | 1048 |
| 042<br>(3.5)     | Low (1)              | 1241                                          | 221 | 702  | 1151 | 245 | 778  | 1058 | 268 | 853  | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1406                                          | 299 | 759  | 1325 | 324 | 826  | 1242 | 349 | 893  | 1158 | 373 | 959  | 1072 | 396 | 1025 |
|                  | Medium (3)           | 1536                                          | 376 | 808  | 1461 | 403 | 869  | 1384 | 427 | 928  | 1305 | 449 | 988  | 1223 | 468 | 1046 |
|                  | Medium/High (4)      | 1656                                          | 466 | 858  | 1584 | 492 | 912  | 1509 | 515 | 966  | 1430 | 533 | 1019 | 1344 | 542 | 1070 |
|                  | High (5)             | -                                             | -   | -    | 1687 | 590 | 955  | 1611 | 610 | 1004 | 1527 | 620 | 1051 | 1428 | 615 | 1097 |
| 048<br>(4.0)     | Low (1)              | 1287                                          | 222 | 695  | -    | -   | -    | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1596                                          | 397 | 817  | 1513 | 422 | 875  | 1432 | 447 | 934  | 1354 | 474 | 995  | 1276 | 501 | 1058 |
|                  | Medium (3)           | 1705                                          | 476 | 858  | 1624 | 501 | 911  | 1545 | 526 | 966  | 1466 | 549 | 1021 | 1386 | 571 | 1077 |
|                  | Medium/High (4)      | 1806                                          | 561 | 895  | 1726 | 587 | 945  | 1646 | 610 | 995  | 1564 | 628 | 1046 | 1476 | 639 | 1096 |
|                  | High (5)             | 1898                                          | 652 | 929  | 1819 | 679 | 977  | 1736 | 698 | 1023 | 1646 | 709 | 1069 | 1547 | 706 | 1112 |
| 060<br>(5.0)     | Low (1)              | 1580                                          | 394 | 859  | 1504 | 420 | 917  | -    | -   | -    | -    | -   | -    | -    | -   | -    |
|                  | Low/Medium (2)       | 1650                                          | 448 | 888  | 1579 | 476 | 945  | 1499 | 478 | 1003 | 1401 | 494 | 1049 | -    | -   | -    |
|                  | Medium (3)           | 1854                                          | 605 | 972  | 1783 | 629 | 1020 | 1703 | 646 | 1065 | 1605 | 648 | 1104 | 1528 | 659 | 1146 |
|                  | Medium/High (4)      | 2120                                          | 856 | 1073 | 2021 | 840 | 1102 | 1908 | 815 | 1127 | 1769 | 772 | 1148 | 1567 | 685 | 1154 |
|                  | High (5)             | 2214                                          | 968 | 1104 | 2089 | 918 | 1121 | 1949 | 859 | 1136 | 1785 | 787 | 1148 | 1576 | 689 | 1154 |

**Table 9: Additional Static Resistance**

| Size<br>(Tons) | CFM  | Wet Indoor Coil | Economizer <sup>1</sup> | Filter/Frame Kit | Electric Heat |
|----------------|------|-----------------|-------------------------|------------------|---------------|
| 024<br>(2.0)   | 500  | 0.01            | 0.00                    | 0.01             | 0.02          |
|                | 600  | 0.01            | 0.00                    | 0.02             | 0.03          |
|                | 700  | 0.01            | 0.00                    | 0.02             | 0.03          |
|                | 800  | 0.01            | 0.01                    | 0.02             | 0.03          |
|                | 900  | 0.01            | 0.01                    | 0.02             | 0.04          |
|                | 1000 | 0.02            | 0.01                    | 0.02             | 0.04          |
|                | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
| 030<br>(2.5)   | 700  | 0.01            | 0.00                    | 0.02             | 0.03          |
|                | 800  | 0.01            | 0.01                    | 0.02             | 0.03          |
|                | 900  | 0.01            | 0.01                    | 0.02             | 0.04          |
|                | 1000 | 0.02            | 0.01                    | 0.02             | 0.04          |
|                | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
|                | 1300 | 0.07            | 0.03                    | 0.17             | -             |
| 036<br>(3.0)   | 700  | 0.01            | 0.00                    | 0.02             | 0.03          |
|                | 800  | 0.01            | 0.01                    | 0.02             | 0.03          |
|                | 900  | 0.01            | 0.01                    | 0.02             | 0.04          |
|                | 1000 | 0.02            | 0.01                    | 0.02             | 0.04          |
|                | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
|                | 1300 | 0.04            | 0.03                    | 0.03             | 0.07          |
|                | 1400 | 0.04            | 0.04                    | 0.03             | 0.08          |
| 042<br>(3.5)   | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
|                | 1300 | 0.04            | 0.03                    | 0.03             | 0.07          |
|                | 1400 | 0.04            | 0.04                    | 0.03             | 0.08          |
|                | 1500 | 0.04            | 0.05                    | 0.04             | 0.09          |
|                | 1600 | 0.04            | 0.06                    | 0.05             | 0.10          |
|                | 1700 | 0.05            | 0.07                    | 0.05             | 0.11          |
|                | 1800 | 0.05            | 0.07                    | 0.06             | 0.11          |
|                | 1900 | 0.06            | 0.08                    | 0.06             | 0.11          |
|                | 2000 | 0.07            | 0.08                    | 0.07             | 0.12          |
|                |      |                 |                         |                  |               |
| 048<br>(4.0)   | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
|                | 1300 | 0.04            | 0.03                    | 0.03             | 0.07          |
|                | 1400 | 0.04            | 0.04                    | 0.03             | 0.08          |
|                | 1500 | 0.04            | 0.05                    | 0.04             | 0.09          |
|                | 1600 | 0.04            | 0.06                    | 0.05             | 0.10          |
|                | 1700 | 0.05            | 0.07                    | 0.05             | 0.11          |
|                | 1800 | 0.05            | 0.07                    | 0.06             | 0.11          |
|                | 1900 | 0.06            | 0.08                    | 0.06             | 0.11          |
|                | 2000 | 0.07            | 0.08                    | 0.07             | 0.12          |
| 060<br>(5.0)   | 1100 | 0.03            | 0.01                    | 0.03             | 0.05          |
|                | 1200 | 0.04            | 0.02                    | 0.03             | 0.06          |
|                | 1300 | 0.04            | 0.03                    | 0.03             | 0.07          |
|                | 1400 | 0.04            | 0.04                    | 0.03             | 0.08          |
|                | 1500 | 0.04            | 0.05                    | 0.04             | 0.09          |
|                | 1600 | 0.04            | 0.06                    | 0.05             | 0.10          |
|                | 1700 | 0.05            | 0.07                    | 0.05             | 0.11          |
|                | 1800 | 0.05            | 0.07                    | 0.06             | 0.11          |
|                | 1900 | 0.06            | 0.08                    | 0.06             | 0.11          |
|                | 2000 | 0.07            | 0.08                    | 0.07             | 0.12          |

1. The pressure drop through the economizer is greater for 100% outdoor air than for 100% return air. If the resistance of the return air duct is less than 0.25 IWG, the unit will deliver less CFM during full economizer operation.

## CHECKING SUPPLY AIR CFM

To check the supply air CFM after the initial balancing has been completed:

1. Remove the two  $\frac{1}{4}$  inch dot plugs in the duct panel.
2. Insert at least 8 inches of  $\frac{1}{4}$  inch tubing into each of these holes for sufficient penetration into the airflow on both sides of the indoor coil.
3. Using an inclined manometer, determine the pressure drop across the dry evaporator coil. Since the moisture on an evaporator coil may vary greatly, measuring the pressure drop across a wet coil under field conditions would be inaccurate. To ensure a dry coil, the compressors should be deactivated while the test is being run.

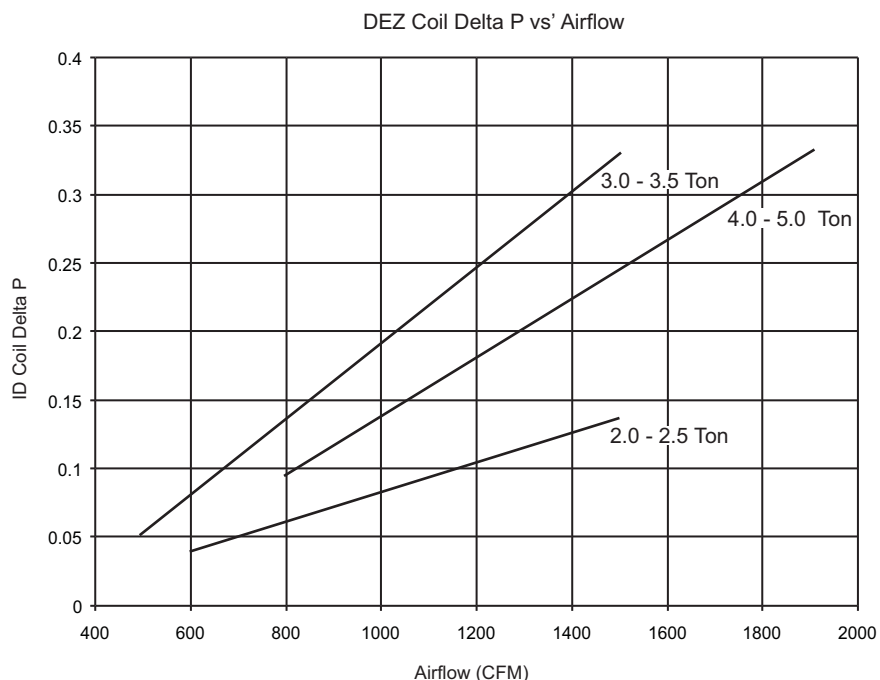
4. Knowing the pressure drop across a dry coil, the actual CFM through the unit can be determined from the curve in Coil Delta P vs. Supply Air CFM figure.

### **WARNING**

Failure to properly adjust the total system air quantity can result in extensive system damage.

After readings have been obtained, remove the tubes and reinstall the two  $\frac{1}{4}$  inch plugs removed in Step 1.

**NOTE:** De-energize the compressors before taking any test measurements to ensure a dry indoor coil.



**FIGURE 9: Coil Delta P vs. Airflow**



**Table 10: Electric Heat Minimum Supply Air**

| Size<br>(Tons) | Voltage      | Minimum Supply Air (CFM) |         |          |           |           |           |
|----------------|--------------|--------------------------|---------|----------|-----------|-----------|-----------|
|                |              | Heater kW                |         |          |           |           |           |
|                |              | 3.8/5.0                  | 5.6/7.5 | 7.5/10.0 | 11.3/15.0 | 15.0/20.0 | 18.8/25.0 |
| 024<br>(2.0)   | 208/230-1-60 | 800                      | 800     | 800      | -         | -         | -         |
| 030<br>(2.5)   | 208/230-1-60 | 800                      | 800     | 800      | 1000      | -         | -         |
| 036<br>(3.0)   | 208/230-1-60 | 1200                     | 1200    | 1200     | 1200      | -         | -         |
|                | 208/230-3-60 | 1200                     | 1200    | 1200     | 1200      | -         | -         |
|                | 460-3-60     | 1200                     | 1200    | 1200     | 1200      | -         | -         |
|                | 575-3-60     | 1200                     | 1200    | 1200     | 1200      | -         | -         |
| 042<br>(3.5)   | 208/230-1-60 | 1200                     | 1200    | 1200     | 1200      | -         | -         |
|                | 208/230-3-60 | -                        | -       | 1200     | 1200      | -         | -         |
|                | 460-3-60     | -                        | -       | 1200     | 1200      | -         | -         |
|                | 575-3-60     | -                        | -       | 1200     | 1200      | -         | -         |
| 048<br>(4.0)   | 208/230-1-60 | -                        | -       | 1600     | 1600      | 1600      | 1600      |
|                | 208/230-3-60 | -                        | -       | 1600     | 1600      | 1600      | 1600      |
|                | 460-3-60     | -                        | -       | 1600     | 1600      | 1600      | 1600      |
|                | 575-3-60     | -                        | -       | 1600     | 1600      | 1600      | 1600      |
| 060<br>(5.0)   | 208/230-1-60 | -                        | -       | 1900     | 1900      | 1900      | 1900      |
|                | 208/230-3-60 | -                        | -       | 1900     | 1900      | 1900      | 1900      |
|                | 460-3-60     | -                        | -       | 1900     | 1900      | 1900      | 1900      |
|                | 575-3-60     | -                        | -       | 1900     | 1900      | 1900      | 1900      |

**Table 11: Indoor Blower Specifications**

| Size<br>(Tons) | Motor |          |      |     |       |
|----------------|-------|----------|------|-----|-------|
|                | HP    | RPM      | Eff. | SF  | Frame |
| 024<br>(2.0)   | 1/2   | Variable | 0.8  | 1.0 | 48    |
| 030<br>(2.5)   | 1/2   | Variable | 0.8  | 1.0 | 48    |
| 036<br>(3.0)   | 1/2   | Variable | 0.8  | 1.0 | 48    |
| 042<br>(3.5)   | 3/4   | Variable | 0.8  | 1.0 | 48    |
| 048<br>(4.0)   | 3/4   | Variable | 0.8  | 1.0 | 48    |
| 060<br>(5.0)   | 1     | Variable | 0.8  | 1.0 | 48    |

**Table 12: Electric Heat Multipliers**

| Voltage |         | kW Capacity Multipliers <sup>1</sup> |
|---------|---------|--------------------------------------|
| Nominal | Applied |                                      |
| 240     | 208     | 0.75                                 |
|         | 230     | 0.92                                 |
| 480     | 460     | 0.92                                 |
| 600     | 575     | 0.92                                 |

1. Electric heaters are rated at nominal voltage. Use this table to determine the electric heat capacity for heaters applied at lower voltages.

Table 13: DEZ024 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 800 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|---------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                               |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                      | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 19.7                                                    | 20.7 | 21.7 | 22.7 | 23.6 | 24.6 | 25.6 | 26.0 | 26.5 | 26.7 | 26.9 |
| 70                | 17.8                                                    | 18.8 | 19.7 | 20.7 | 21.7 | 22.6 | 23.6 | 24.3 | 24.9 | 25.3 | 25.6 |
| 75                | 15.9                                                    | 16.9 | 17.8 | 18.8 | 19.7 | 20.7 | 21.6 | 22.5 | 23.4 | 23.8 | 24.2 |
| 80                | 14.0                                                    | 14.9 | 15.9 | 16.8 | 17.7 | 18.7 | 19.6 | 20.7 | 21.8 | 22.4 | 22.9 |
| 85                | 12.1                                                    | 13.0 | 13.9 | 14.8 | 15.8 | 16.7 | 17.6 | 18.9 | 20.2 | 20.9 | 21.6 |
| 90                | 6.0                                                     | 7.3  | 8.8  | 10.2 | 11.6 | 13.0 | 14.4 | 16.3 | 18.3 | 19.3 | 20.3 |
| 95                | -                                                       | -    | -    | 5.5  | 7.3  | 9.2  | 11.1 | 13.7 | 16.4 | 17.7 | 19.0 |
| 100               | -                                                       | -    | -    | -    | 5.9  | 7.4  | 8.9  | 12.2 | 15.4 | 17.1 | 18.7 |
| 105               | -                                                       | -    | -    | -    | -    | 5.5  | 6.7  | 10.6 | 14.5 | 16.5 | 18.4 |
| 110               | -                                                       | -    | -    | -    | -    | -    | -    | 9.0  | 13.5 | 15.8 | 18.1 |
| 115               | -                                                       | -    | -    | -    | -    | -    | -    | 7.4  | 12.6 | 15.2 | 17.8 |

Table 14: DEZ030 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 950 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|---------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                               |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                      | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 24.6                                                    | 25.6 | 26.6 | 27.7 | 28.7 | 29.8 | 30.8 | 31.2 | 31.7 | 31.9 | 32.1 |
| 70                | 19.8                                                    | 21.2 | 22.6 | 24.0 | 25.3 | 26.7 | 28.1 | 28.9 | 29.6 | 30.0 | 30.3 |
| 75                | 15.0                                                    | 16.8 | 18.5 | 20.2 | 22.0 | 23.7 | 25.5 | 26.5 | 27.5 | 28.1 | 28.6 |
| 80                | 10.2                                                    | 12.3 | 14.4 | 16.5 | 18.6 | 20.7 | 22.8 | 24.1 | 25.5 | 26.1 | 26.8 |
| 85                | 5.5                                                     | 7.9  | 10.3 | 12.8 | 15.2 | 17.7 | 20.1 | 21.7 | 23.4 | 24.2 | 25.0 |
| 90                | -                                                       | -    | 6.3  | 8.3  | 10.3 | 12.3 | 14.3 | 17.2 | 20.1 | 21.6 | 23.0 |
| 95                | -                                                       | -    | -    | -    | 5.4  | 6.9  | 8.5  | 12.7 | 16.8 | 18.9 | 21.0 |
| 100               | -                                                       | -    | -    | -    | -    | 5.2  | 6.4  | 9.5  | 12.6 | 14.2 | 15.8 |
| 105               | -                                                       | -    | -    | -    | -    | -    | -    | 6.3  | 8.4  | 9.5  | 10.6 |
| 110               | -                                                       | -    | -    | -    | -    | -    | -    | -    | -    | -    | 5.3  |
| 115               | -                                                       | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |

Table 15: DEZ036 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 1,200 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                                 |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                        | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 26.2                                                      | 28.2 | 30.2 | 32.2 | 34.2 | 36.2 | 38.2 | 35.1 | 32.0 | 30.5 | 29.0 |
| 70                | 22.9                                                      | 24.6 | 26.3 | 28.1 | 29.8 | 31.5 | 33.3 | 31.4 | 29.5 | 28.6 | 27.6 |
| 75                | 19.5                                                      | 21.0 | 22.5 | 23.9 | 25.4 | 26.9 | 28.4 | 27.7 | 27.0 | 26.6 | 26.3 |
| 80                | 16.2                                                      | 17.4 | 18.6 | 19.8 | 21.0 | 22.2 | 23.4 | 23.9 | 24.4 | 24.7 | 24.9 |
| 85                | 12.9                                                      | 13.8 | 14.7 | 15.7 | 16.6 | 17.6 | 18.5 | 20.2 | 21.9 | 22.7 | 23.5 |
| 90                | 5.7                                                       | 7.3  | 8.8  | 10.4 | 11.9 | 13.5 | 15.0 | 17.2 | 19.4 | 20.5 | 21.5 |
| 95                | -                                                         | -    | -    | 5.0  | 7.2  | 9.3  | 11.5 | 14.2 | 16.9 | 18.2 | 19.5 |
| 100               | -                                                         | -    | -    | -    | 5.8  | 7.5  | 9.1  | 11.0 | 12.9 | 13.8 | 14.7 |
| 105               | -                                                         | -    | -    | -    | -    | 5.6  | 6.7  | 7.7  | 8.8  | 9.4  | 10.0 |
| 110               | -                                                         | -    | -    | -    | -    | -    | -    | -    | -    | -    | 5.2  |
| 115               | -                                                         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |

Table 16: DEZ042 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 1,400 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                                 |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                        | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 23.1                                                      | 23.4 | 23.7 | 24.0 | 24.4 | 24.7 | 25.0 | 24.7 | 24.4 | 24.3 | 24.2 |
| 70                | 20.2                                                      | 20.6 | 21.1 | 21.5 | 21.9 | 22.4 | 22.8 | 22.9 | 22.9 | 23.0 | 23.0 |
| 75                | 17.3                                                      | 17.9 | 18.4 | 19.0 | 19.5 | 20.1 | 20.6 | 21.0 | 21.4 | 21.6 | 21.8 |
| 80                | 14.4                                                      | 15.1 | 15.7 | 16.4 | 17.1 | 17.7 | 18.4 | 19.1 | 19.9 | 20.3 | 20.6 |
| 85                | 11.5                                                      | 12.3 | 13.1 | 13.9 | 14.6 | 15.4 | 16.2 | 17.3 | 18.4 | 18.9 | 19.4 |
| 90                | 8.2                                                       | 9.0  | 9.8  | 10.6 | 11.4 | 12.2 | 13.0 | 14.5 | 16.0 | 16.8 | 17.6 |
| 95                | -                                                         | 5.7  | 6.5  | 7.3  | 8.2  | 9.0  | 9.8  | 11.8 | 13.7 | 14.7 | 15.7 |
| 100               | -                                                         | -    | 5.3  | 5.9  | 6.5  | 7.1  | 7.8  | 9.3  | 10.8 | 11.6 | 12.3 |
| 105               | -                                                         | -    | -    | -    | -    | 5.3  | 5.7  | 6.8  | 7.9  | 8.4  | 8.9  |
| 110               | -                                                         | -    | -    | -    | -    | -    | -    | -    | -    | 5.3  | 5.6  |
| 115               | -                                                         | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |

Table 17: DEZ048 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 1,800 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                                 |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                        | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 16.2                                                      | 18.1 | 20.0 | 22.0 | 23.9 | 25.9 | 27.8 | 28.7 | 29.6 | 30.1 | 30.6 |
| 70                | 16.6                                                      | 18.1 | 19.6 | 21.1 | 22.6 | 24.1 | 25.6 | 26.6 | 27.7 | 28.2 | 28.7 |
| 75                | 17.0                                                      | 18.1 | 19.2 | 20.2 | 21.3 | 22.3 | 23.4 | 24.5 | 25.7 | 26.3 | 26.8 |
| 80                | 17.5                                                      | 18.1 | 18.7 | 19.3 | 20.0 | 20.6 | 21.2 | 22.5 | 23.7 | 24.3 | 25.0 |
| 85                | 17.9                                                      | 18.1 | 18.3 | 18.5 | 18.6 | 18.8 | 19.0 | 20.4 | 21.7 | 22.4 | 23.1 |
| 90                | 15.7                                                      | 15.9 | 16.1 | 16.3 | 16.5 | 16.7 | 16.9 | 18.4 | 20.0 | 20.8 | 21.6 |
| 95                | 13.4                                                      | 13.6 | 13.8 | 14.0 | 14.3 | 14.5 | 14.7 | 16.5 | 18.3 | 19.2 | 20.1 |
| 100               | 11.2                                                      | 11.6 | 12.1 | 12.5 | 13.0 | 13.5 | 13.9 | 15.5 | 17.0 | 17.8 | 18.5 |
| 105               | 9.0                                                       | 9.7  | 10.4 | 11.1 | 11.8 | 12.5 | 13.2 | 14.4 | 15.7 | 16.3 | 16.9 |
| 110               | 6.7                                                       | 7.7  | 8.6  | 9.6  | 10.5 | 11.4 | 12.4 | 13.4 | 14.4 | 14.9 | 15.3 |
| 115               | -                                                         | 5.7  | 6.9  | 8.1  | 9.2  | 10.4 | 11.6 | 12.3 | 13.0 | 13.4 | 13.8 |

Table 18: DEZ060 Superheat Charging

| Outdoor Temp (°F) | Superheat at Compressor Suction (°F), Airflow = 1,850 CFM |      |      |      |      |      |      |      |      |      |      |
|-------------------|-----------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|
|                   | Indoor Wet Bulb Temp (°F)                                 |      |      |      |      |      |      |      |      |      |      |
|                   | 55                                                        | 57   | 59   | 61   | 63   | 65   | 67   | 69   | 71   | 73   | 75   |
| 65                | 23.1                                                      | 23.1 | 23.1 | 23.2 | 23.2 | 23.3 | 23.3 | 23.7 | 24.2 | 24.4 | 24.6 |
| 70                | 18.9                                                      | 19.4 | 19.9 | 20.4 | 20.9 | 21.4 | 21.9 | 22.4 | 22.9 | 23.2 | 23.5 |
| 75                | 14.8                                                      | 15.8 | 16.7 | 17.6 | 18.6 | 19.5 | 20.5 | 21.1 | 21.7 | 22.0 | 22.3 |
| 80                | 10.7                                                      | 12.1 | 13.5 | 14.9 | 16.2 | 17.6 | 19.0 | 19.7 | 20.4 | 20.8 | 21.2 |
| 85                | 6.6                                                       | 8.4  | 10.2 | 12.1 | 13.9 | 15.8 | 17.6 | 18.4 | 19.2 | 19.6 | 20.0 |
| 90                | 8.7                                                       | 9.9  | 11.0 | 12.1 | 13.2 | 14.3 | 15.4 | 16.5 | 17.6 | 18.2 | 18.7 |
| 95                | 10.9                                                      | 11.3 | 11.7 | 12.1 | 12.4 | 12.8 | 13.2 | 14.6 | 16.0 | 16.7 | 17.4 |
| 100               | 8.3                                                       | 8.6  | 8.9  | 9.1  | 9.4  | 9.7  | 9.9  | 11.6 | 13.3 | 14.1 | 15.0 |
| 105               | 5.8                                                       | 5.9  | 6.1  | 6.2  | 6.3  | 6.5  | 6.6  | 8.6  | 10.6 | 11.6 | 12.5 |
| 110               | -                                                         | -    | -    | -    | -    | -    | -    | 5.6  | 7.9  | 9.0  | 10.1 |
| 115               | -                                                         | -    | -    | -    | -    | -    | -    | -    | 5.1  | 6.4  | 7.7  |

## Operation

### Cooling Sequence Of Operations

The following sequences of operation are based on using a standard single-stage cooling thermostat.

With Power To Unit And Thermostat In Cooling Mode.

1. If the fan switch on the thermostat is in the "ON" position, the 24 volts at "G" will be sent to the indoor motor and the blower will operate at the selected airflow. If the fan switch is in the "AUTO" position, the blower will operate at the selected airflow only when there is a call for cooling by the thermostat.
2. On a call for cooling, the thermostat will send 24 volts to "Y" on the fan control board. The 24 volt signal will energize contactor "M1", and power will be supplied to the compressor and outdoor fan motor. If the fan switch on the thermostat is on the "AUTO" position, the thermostat will also send a 24 volt signal to "G" on the fan control board and the indoor blower will operate as indicated in step 1.
3. When the demand for cooling has been satisfied, the "M1" contactor will be de-energized when the 24 volt "Y" signal is removed. If the fan switch on the thermostat is in the "ON" position, the indoor blower will continue to run. If the fan switch is in the "AUTO" position, the 24 volt "G" signal will be removed, and after a 30 second delay, the indoor blower motor will shut down.

### Heating Sequence Of Operations

With Power To Unit And Thermostat In Heating Mode.

1. If the fan switch on the thermostat is in the "ON" position, the 24 volts at "G" will be sent to the indoor motor and the blower will operate at the selected airflow. If the fan switch is in the "AUTO" position, the blower will operate at the selected airflow only when there is a call for heating by the thermostat.
2. On a call for heating, the thermostat will send 24 volts to "W1" on the fan control board. The 24 volts signal will energize relay "K2" on the fan control board, and the first stage of electric heat will be energized. The indoor blower will operate as indicated in step 1.
3. On units with 2 (two) stages of electric heat, the second bank of heaters will be energized by a 24 volt signal to "W2" on the fan control board. After a 20 second delay, the third bank of heaters will be energized if the unit is so equipped.
4. When the heating demand is satisfied, the electric heat will be de-energized when the 24 volt "W1" and "W2" signals are removed. If the fan switch on the thermostat is in the "ON" position, the indoor blower will continue to run. If the fan switch is in the "AUTO" position, the indoor motor will shut off after the appropriate time delay.

Please refer to Tables 19 and 20 for more information.

**Table 19: Thermostat Signals (Single Phase Units)**

| Signal      | State | Board Function                                                                                                                                                            |
|-------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| G           | ON    | FAN INSTANT ON                                                                                                                                                            |
|             | OFF   | FAN INSTANT OFF                                                                                                                                                           |
| G & Y       | ON    | FAN INSTANT ON<br>COMPRESSOR AND OUTDOOR FAN INSTANT ON                                                                                                                   |
|             | OFF   | COMPRESSOR AND OUTDOOR FAN INSTANT OFF<br>FAN 30 SECOND DELAY OFF                                                                                                         |
| G & W1      | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1) INSTANT ON                                                                                                                        |
|             | OFF   | HEATER BANK 1 (HTR 1) INSTANT OFF<br>FAN 10 SECOND DELAY OFF                                                                                                              |
| G & W1 & W2 | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1) INSTANT ON<br>HEATER BANK 2 (HTR 2 & HTR 3) 10 SECOND DELAY ON<br>HEATER BANK 3 (HTR 4 & HTR 5) 20 SECOND DELAY ON                |
|             | OFF   | HEATER BANK 3 (HTR 4 & HTR 5) INSTANT OFF<br>HEATER BANK 2 (HTR 2 & HTR 3) ½ SECOND DELAY ON<br>HEATER BANK 1 (HTR 1) 1 SECOND DELAY ON<br><b>FAN 10 SECOND DELAY OFF</b> |
| W1          | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1) INSTANT ON                                                                                                                        |
|             | OFF   | HEATER BANK 1 (HTR 1) INSTANT OFF<br>FAN 10 SECOND DELAY OFF                                                                                                              |
| W2          | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1) INSTANT ON<br>HEATER BANK 2 (HTR 2 & HTR 3) 10 SECOND DELAY ON                                                                    |
|             | OFF   | HEATER BANK 2 (HTR 2 & HTR 3) INSTANT OFF<br>HEATER BANK 1 (HTR 1) ½ SECOND DELAY OFF<br>FAN 10 SECOND DELAY OFF                                                          |

**Table 20: Thermostat Signals (Three Phase Units)**

| Signal      | State | Board Function                                                                                                                       |
|-------------|-------|--------------------------------------------------------------------------------------------------------------------------------------|
| G           | ON    | FAN INSTANT ON                                                                                                                       |
|             | OFF   | FAN INSTANT OFF                                                                                                                      |
| G & Y       | ON    | FAN INSTANT ON<br>COMPRESSOR AND OUTDOOR FAN INSTANT ON                                                                              |
|             | OFF   | COMPRESSOR AND OUTDOOR FAN INSTANT OFF<br>FAN 30 SECOND DELAY OFF                                                                    |
| G & W1      | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1, 2 & 3) INSTANT ON                                                                            |
|             | OFF   | HEATER BANK 1 (HTR 1, 2 & 3) INSTANT OFF<br>FAN 10 SECOND DELAY OFF                                                                  |
| G & W1 & W2 | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1, 2 & 3) INSTANT ON<br>HEATER BANK 2 (HTR 4, 5 & 6) 10 SECOND DELAY ON                         |
|             | OFF   | HEATER BANK 2 (HTR 4, 5 & 6) ½ SECOND DELAY OFF<br>HEATER BANK 1 (HTR 1, 2 & 3) 1 SECOND DELAY OFF<br><b>FAN 10 SECOND DELAY OFF</b> |
| W1          | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1, 2 & 3) INSTANT ON                                                                            |
|             | OFF   | HEATER BANK 1 (HTR 1, 2 & 3) INSTANT OFF<br>FAN 10 SECOND DELAY OFF                                                                  |
| W2          | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1, 2 & 3) INSTANT ON<br>HEATER BANK 2 (HTR 4, 5 & 6) 10 SECOND DELAY ON                         |
|             | OFF   | HEATER BANK 2 (HTR 4, 5 & 6) INSTANT OFF<br>HEATER BANK 1 (HTR 1, 2 & 3) ½ SECOND DELAY OFF<br>FAN 10 SECOND DELAY OFF               |
| W1 & W2     | ON    | FAN INSTANT ON<br>HEATER BANK 1 (HTR 1, 2 & 3) INSTANT ON<br>HEATER BANK 2 (HTR 4, 5 & 6) 10 SECOND DELAY ON                         |
|             | OFF   | HEATER BANK 2 (HTR 4, 5 & 6) ½ SECOND DELAY ON<br>HEATER BANK 1 (HTR 1, 2 & 3) 1 SECOND DELAY ON<br><b>FAN 10 SECOND DELAY OFF</b>   |

## Maintenance

### Normal Maintenance

#### WARNING

Prior to any of the following maintenance procedures, shut off all power to the unit, to avoid personal injury.

Periodic maintenance consists of changing or cleaning filters and general cleaning of the outdoor coil.

**FILTERS** - Inspect once a month. Replace Disposable or clean Permanent Type as necessary. DO NOT replace Permanent Type with Disposable.

**MOTORS** - Indoor and outdoor fan motors are permanently lubricated and require no maintenance.

**OUTDOOR COIL** - Dirt should not be allowed to accumulate on the outdoor coil surface or other parts in the air circuit. Cleaning should be as often as necessary to keep the coil clean. Use a brush, vacuum cleaner attachment, or other suitable means. If water is used to clean the coil, be sure that the power to the unit is shut off prior to cleaning.

#### CAUTION

Exercise care when cleaning the coil so that the coil fins are not damaged.  
Do not permit the hot condenser air discharge to be obstructed by overhanging structures or shrubs.

## Troubleshooting

#### WARNING

Troubleshooting of components necessarily requires opening the electrical control box with the power connected to the unit. Use extreme care when working with live circuit! Check the unit nameplate for the correct range before making any connections with line terminals.

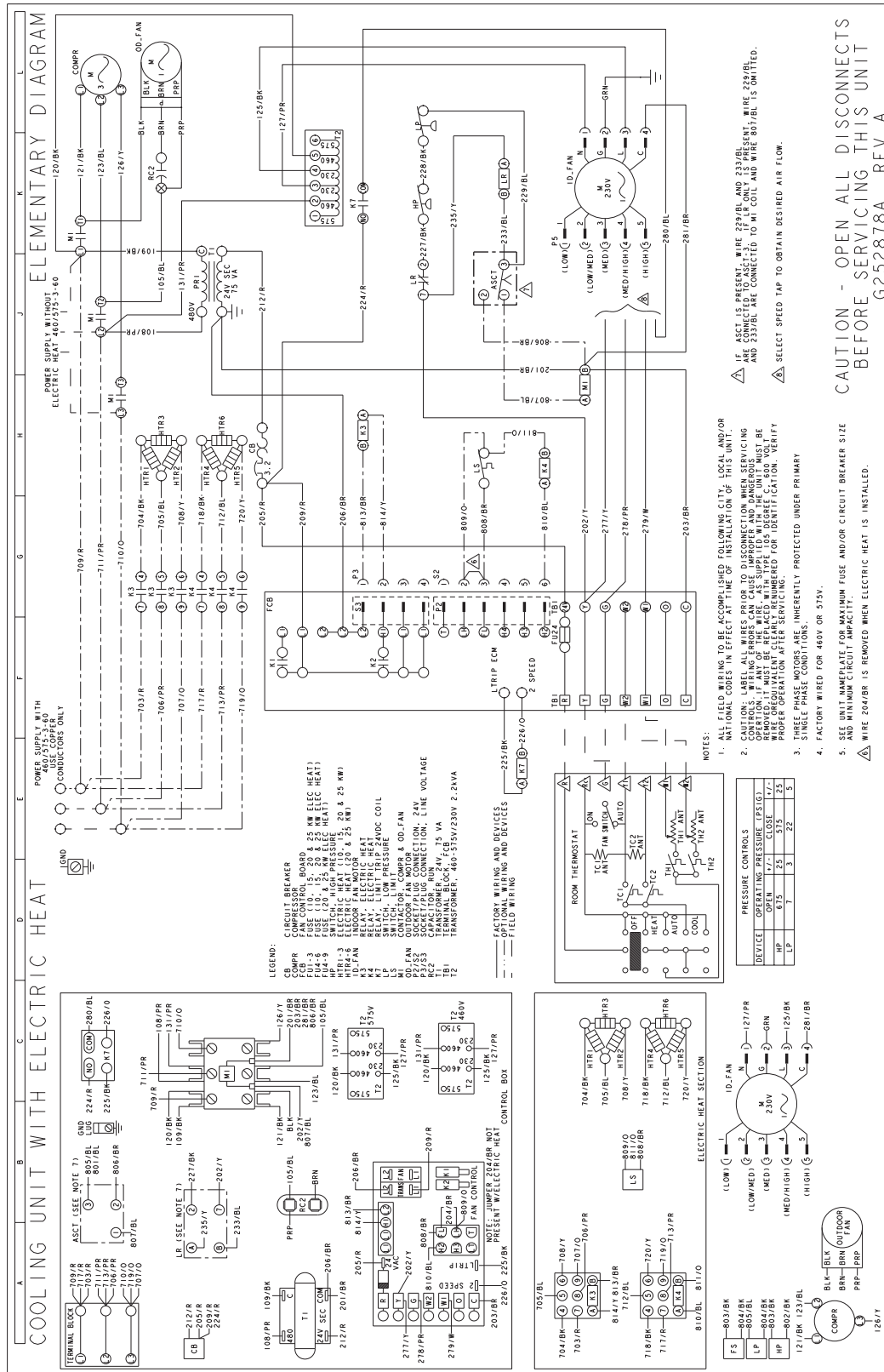
#### CAUTION

The wire number or color and terminal designations referred to may vary. Check the wiring label inside the control box access panel for the correct wiring.





## Typical DEZ036-060 Cooling Unit 460/575-3-60 volt Wiring Diagram





## R-410A QUICK REFERENCE GUIDE

**Refer to Installation Instructions for specific installation requirements.**

- R-410A Refrigerant operates at 50 - 70 percent higher pressures than R-22. Be sure that servicing equipment and replacement components are designed to operate with R-410A.
- R-410A Refrigerant cylinders are rose colored.
- Recovery cylinder service pressure rating must be 400 psig, DOT 4BA400, or DOT BW400.
- Recovery equipment must be rated for R-410A.
- **Do Not** use R-410A service equipment on R-22 systems. All hoses, gages, recovery cylinders, charging cylinders and recovery equipment must be dedicated for use on R-410A systems only.
- Manifold sets must be at least 700 psig high side, and 180 psig low side, with 550 psig retard.
- All hoses must have a service pressure rating of 800 psig.
- Leak detectors must be designed to detect HFC refrigerants.
- Systems must be charged with liquid refrigerant. Use a commercial type metering device in the manifold hose.
- R-410A can only be used with POE type oils.
- POE type oils rapidly absorb moisture from the atmosphere.
- Vacuum pumps will **not** remove moisture from POE type oils.
- **Do not** use liquid line driers with a rated working pressure rating less than 600 psig.
- **Do not** install suction line driers in the liquid line.
- A liquid line drier is required on every unit.
- **Do not** use a R-22 TXV. If a TXV is to be used, it must be a R-410A TXV.
- Never open system to atmosphere when under a vacuum.
- If system must be opened for service, evacuate system then break the vacuum with dry nitrogen and replace all filter driers.

Figure 10: R-410A Quick Reference Guide